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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,733	03/30/2001	Taizo Yamamoto		5466

30132 7590 03/27/2003

GEORGE A. LOUD
3137 MOUNT VERNON AVENUE
ALEXANDRIA, VA 22305

EXAMINER

CHANEY, CAROL DIANE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.



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Office Action Summary

Application No.

09/821,733

Applicant(s)

YAMAMOTO ET AL.

Examiner

Carol Chaney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-15, 17, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors.

In claim 8, the meaning of "conductive material" is unclear, as a type of conductivity is not stated. Ionic, electronic, or thermal conductivity could be reasonable in the context.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9, 15, 17 and 18 rejected under 35 U.S.C. 102(b) as being anticipated by Imahashi et al., US Patent 5,350,643

With regards to claims 1-3 and 17, Imahashi et al. disclose solid polymer electrolyte membrane fuel cells having a hydrogen electrode comprising a catalyst layer and a gas diffusion layer, and an oxygen electrode comprising a catalyst layer and a gas diffusion layer. (Note Figs 1 and 2 and column 3, lines 60-66.) The water repellency of the hydrogen (fuel) electrode is higher than that of the oxygen electrode. (Column 4, lines 7-8.)

With regards to claims 4-7, and exemplary embodiment of the Imahashi et al. invention teaches a hydrogen electrode containing 30% by weight of polytetrafluoroethylene (PTFE) as a hydrophobic material and an oxygen electrode containing 20% by weight of PTFE as a hydrophobic material. (Column 7, lines 2-9.)

With regards to claim 8, both the hydrogen and oxygen electrodes disclosed by Imahashi et al. also contain the conductive materials platinum and a proton conductor. The additional PTFE in the hydrogen electrode will render the platinum and proton conductor more water repellent in the hydrogen electrode than in the oxygen electrode.

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With regards to claim 9, in an exemplary embodiment, an aqueous suspension of PTFE is used to make the electrodes; such a suspension contains particulate PTFE. (Column 7, lines 42-50.)

With regards to claim 18, the reaction of hydrogen and oxygen during the operation of the fuel cell will supply water to the oxygen electrode.

Claims 1-7 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeuchi et al., US Patent 4,643,957.

Takeuchi et al. disclose a fuel cell having a pair of gas diffusible electrodes sandwiching an electrolyte-retaining matrix (layer). The amount of water repellent binder in the anode can be between 0.81 and 1.2 times that in the cathode. This includes cases where the amount of binder in the anode is greater than in the cathode, and thus the anode has a higher water repellency than the cathode.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imahashi et al.

As discussed above, Imahashi et al. disclose applicants' invention essentially as claimed, with the exception that Imahashi et al. do not explicitly disclose gas diffusion layers having a water repellent layer coating both major surfaces of the gas diffusion electrode. However, coating both sides of the gas diffusion layer is considered a duplication of parts, and the duplication of parts (for a multiplied effect) has been shown to be obvious unless a synergistic effect can be shown. See *St. Regis Paper Co. v. Bemis Co., Inc.*, 193 USPQ 8, 11, (7th Cir.) 1977.

Imahashi et al. further do not disclose specific water contact angles for the water repellent layers. However, applicants' invention as a whole would have been obvious over the disclosure of Imahashi et al. because one of ordinary skill in the art would recognize "water-contact angles" to be an alternative description of "water-repellency" discussed by Imahashi et al.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cipollini, US Patent 6,379,827; vanOmmering et al., US Patent 4,614,025 disclose hydrophobic layers in fuel cells.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (703) 305-3777. The examiner can normally be reached on Mon - Fri 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 703-308-2383. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Carol Chaney
Primary Examiner
Art Unit 1745

cc
December 11, 2002